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FLOODPLAIN MANAGEMENT RECONNAISSANCE STUDY REPORT

NIOTA

HANCOCK COUNTY



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VILLAGE OF NIOTA

HANCOCK COUNTY, ILLINOIS

FLOODPLAIN MANAGEMENT

RECONNAISSANCE STUDY

Prepared by

US DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Champaign, Illinois

In cooperation with

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

DIVISION OF WATER RESOURCES

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VILLAGE OF NIOTA
RECONNAISSANCE STUDY

INTRODUCTION

Use of floodprone areas can be a severe problem in Illinois. Urbanization and floodplain encroachment are increasing the severity of this problem. Over 800 communities in Illinois have been identified as having flood problems.

The Illinois Division of Water Resources (DWR) is the responsible state agency for urban flood control and for setting priorities of flood studies within urban areas. The Soil Conservation Service is providing assistance to the Division of Water Resources in setting these priorities. A joint coordination agreement was executed between the Division of Water Resources, State of Illinois, and the USDA, Soil Conservation Service on April 30, 1976 and revised in December 1978 to furnish technical assistance in carrying out Flood Hazard Studies. These studies are carried out in accordance with Federal Level Recommendation 3 of "A Unified National Program for Floodplain Management", and under Section 6 of Public Law 83-566. A plan of study was executed in October 1986 for reconnaissance studies for 4 Illinois communities. These reconnaissance studies will utilize existing floodplain information, historical high water profiles, and the 100 year floodplain from flood insurance studies when available. Average annual damages are estimated for the structures within the floodplain.

The study was conducted and the report provided for the following purposes: 1) to evaluate needs for additional future studies, 2) to estimate average annual damages, 3) to provide an updated estimate of the 100 year floodplain map, and 4) to provide guidance and recommendations to the community for improved floodplain management.

STUDY AREA DESCRIPTION

The Village of Niota is located in Hancock County, just across the Mississippi River from Fort Madison, Iowa, and approximately 22 miles north and west of Carthage. Niota is an unincorporated village and the estimated population is 375, according to local residents.

Transportation facilities within the Niota area consist of Illinois State Routes #9 and #96 and the Mississippi River. The Atchison Topeka and Santa Fe Railroad and Amtrak Railroad lines go through Niota as well as across the river to Fort Madison. There is no station, but a railroad siding is available at the elevator. No port or other docking facilities are available. Amoco Oil has a commercial barge dock approximately 1 mile upstream from Niota.

Niota is protected from floodwaters by a levee along the Mississippi River. This levee is constructed to protect the area from between the 50 and 100 year flood. The small drainage ditch to the south of the community also has a levee constructed to protect the village.

The main concern for the residents of Niota is the Mississippi River. An extremely large rainfall, ice jams, and spring thaws with additional rainfall are some of the events about which the residents worry. Any combination of the above problems may cause difficulties for the existing levee system, which also suffers from seepage problems during periods of high water.

The original community of Niota was to the southwest of the existing village. When the many locks and dams were constructed in the Mississippi River, the new surface water elevations submerged the old village site. At low river water elevations the old concrete foundations of the original buildings can be seen.

The drainage area of the unnamed tributary south of Niota is 1.4 square miles and is in the Upper Mississippi River Basin, hydrologic unit #07080104, subwatershed #210. The Mississippi River has a drainage area of 119,000 square miles at Pontoosuc, which is 4 miles east of Niota. Niota is located 21 miles upstream from lock and dam #19 at Keokuk, Iowa.

The upland portion of the unnamed tributary drainage area is 700 feet above sea level in flat prairie land. It then plunges through rough, broken, well drained timber land with approximately 165 feet of drop to the flat bottomland (a distance of about 1 1/2 miles) that extends approximately 1 mile upstream from its outlet at the river. The upland and bottomland areas that are in cropland have corn and soybeans as the main crops. Conventional tillage is the primary method of farming.

The average rainfall is 35 inches per year with 65 to 70 percent occurring during the growing season. Annual snowfall is 18 to 26 inches per year.

The soils in the area of Niota are of the Sawmill-Lawson association. These are nearly level to gently sloping soils on the floodplains of the Mississippi River. They are poorly drained and somewhat poorly drained soils that formed in clayey and silty sediments in bottomlands. These soils are not suited for urban uses, roads, or sanitary facilities because of their poor drainage and high water holding capability. They are well suited for row crops if adequately drained and protected from flooding.

The water supply is from individual wells which are generally sand points at a very shallow depth. The fire department has a deep well, as does one other person in the village. It was noted that the sand points need to be replaced quite frequently.

NATURAL VALUES

The unnamed tributary to the south of the community has excellent wildlife cover. It has been left in a brushy, tree lined condition except for the lower mile. This also has some existing brush that will eventually be removed because of the drainage problems. The cropland, with mainly a corn and soybean rotation with some grassland, is generally in long, narrow fields or irregular shaped fields that are normally bordered by roads, railroads, trees, or small brush lined drainage ditches, or large wooded areas. Conservation tillage or no-till would provide more cover for small game. The opportunity of living close to a navigable stream with scattered natural wildlife and plant habitats make the area a better place to live, work and play. The scenic views in Niota of the Mississippi River on one side and the timbered bluffs on the other side are good all year but are particularly exceptional in spring and fall. State Route #96 is part of the Lincoln Heritage Trail.

FLOOD PROBLEMS

The unnamed tributary has the potential for flash flooding, but the properties are somewhat protected by a levee. In the 1962 flood, a log jam in this ditch caused the levee to fail, putting water into the community. The flood of 1965 was higher than normal because the levee was unrepaired. The flood of 1973 was the worst that any resident had ever seen, and this was after the above levee was repaired and the ditch had been cleared and snagged of debris. After this flood it was suggested that the community should dissolve, as the entire area is flooded by a storm such as the 1973 flood.

As expected, the most serious threat of flooding is from the river during the early spring runoff. With the existing conditions, it will probably take a 50-year storm or larger to damage the levees and do much property damage at Niota. Seepage through the levees at high water elevations will probably always be a problem because of the materials used in the levee construction.

Large, rapid rainfalls and excessive runoff from the steep unnamed watershed south of the village will probably always be a concern. Small problems are not corrected until they become major problems and the community does not have the finances to handle a lot of repairs or works of improvement.

Due to a community fund raising effort, a 24-inch pump was installed in 1978 to help remove standing surface water. This pump has automatic gates and the electricity to run it is supplied free of charge to the community by Union Electric of Iowa. After this pump was installed, Union Electric repaired and updated their two existing 8 inch pumps.

The sanitary facilities are individual septic systems. The filter fields are all located in areas that are all subject to the 100 year flood. This could have a detrimental affect on the efficient operation of the filter fields to control pollution. The existing septic systems seem to work fairly well, even though approximately 2 feet under the existing topsoil, sand is found. The spring time would be the normal problem time, as well as long existing wet periods for the septic systems. Since the entire community is located in the 100 year floodplain, plans for updating the waste facilities have not been planned.

Some storm sewers are located throughout the village. When State Highway #96 improvements were started in 1979, additional lines of tile were installed. At this time, future expansion to the system does not appear to be a possibility.

There are approximately 35 to 40 basements of which most are the shallow type. During larger storm events, all are subject to water related problems. Several of the homes are constructed 1 to 2 feet off the ground, but several garages and storage sheds are at ground elevation. The use of sump pumps is not a major factor because during the larger storm events, their use would be of little help since most of the community would probably be inundated by floodwaters.

The village can have very restricted access during severe flooding conditions because the roads are inundated to the extent that they are unuseable. The west end of the community can expect three to four feet of water during the larger events.

It appears that more runoff water from the east may be coming into the system that possibly flowed east at one time. With the Union Electric and village pumps, surface water for the lower frequency rainfalls does not seem to be a problem, more of a nuisance. Some drainage from the northeast of the community is also pumped north to the river, making the farm land involved a little easier to manage.

Since Niota is an unincorporated community, they would follow the rules of Hancock County when building permits, ordinances, or zoning to control development in the floodplain requests are applied for. No new construction subject to the 100 year flood elevation should be allowed in the village. At present, residents are aware of the water related problems throughout the community.

PROBLEM SUMMARY

Estimated average annual damages to the Village of Niota are as listed below:

| Number of Homes | Number of Garages & Sheds | Number of Businesses | Trailers | Total Value | Average Annual Damages |
|---------------------------------------|------------------------------|-------------------------|----------|----------------|---------------------------|
| 78 | 51 | 16 | 11 | \$4,216,000 | \$40,000 |
| Street damages due to flooding = | | | | \$2500 | |
| Septic system maintenance & repairs = | | | | 2500 | |
| Lawn damages due to flooding = | | | | 1500 | |
| Wet basements @ 35 = | | | | <u>1000</u> | |
| Total Additional Damages = | | | | \$7,500 | |

Estimated average annual damages for the Village of Niota = \$47,500. It is estimated that flood damages start at the 5 year frequency storm. In addition, agricultural flooding (approximately 360 acres) would approximately cause \$5400 in damages each year.

In the event of a 100 year frequency flood, the damages would exceed \$2,225,000 and possibly destroy most of the community. Many areas of agricultural land would also suffer very heavy losses during a storm of this magnitude.

EXISTING FLOODPLAIN MANAGEMENT

The Village of Niota can participate in the National Flood Insurance Program. Hancock County joined the Emergency Phase on April 25, 1980, meaning all unincorporated areas of the county are to be included in the program. Hancock County has zoning ordinances in effect and building permits are required regarding building in the floodplain. The map in this report is the same as the 1981 Flood Insurance Rate Map.

RECOMMENDATIONS

It is recommended that the Village of Niota follow the floodplain ordinance requirements regarding building in the floodplain for Hancock County. The residents should also avail themselves of flood insurance and consider instituting individual floodproofing activities as described in manuals from the Illinois Division of Water Resources. These include "Protect Your Home From Flood Damage", "Protect Your Basement From Flood Damage", and "Elevating and Relocating a House to Reduce Flood Damage".

The February 1977, US Army Corps of Engineers report on the Mississippi River flooding states, "The most obvious structural solution to protect Niota from high flood flows would be to raise the 3.9 miles of existing levee and improve the interior drainage situation." Further studies were terminated since none of the alternatives resulted in a favorable benefit-to-cost ratio. The above structural recommendation would still apply to the community at the present time.

Septic systems must be kept in good working order and separated from the water supply sources to prevent possible health hazards to the residents of the community. The village may need to install a sewage disposal system in the future. Any new septic systems constructed should include an adequate filter field. Correct procedures for installing this type of system may be obtained from the local Soil & Water Conservation District office and the County Health Department.

The village should develop an emergency action plan with the county Emergency Services and Disaster Agency (ESDA) assuming the leadership. Using such a plan, the community could evacuate when the river reaches a predetermined

critical elevation. In addition to the possibility of saving lives, many dollars of personal property could also be saved by evacuation.

It would be advisable for the village to make provisions for spraying to control the mosquito problem. This type of high breeding habitat for mosquitoes will have to be watched and action taken when necessary to control a problem that could be potentially dangerous.

After large rainfalls, and possible overflowing conditions, water from the wells should be tested to be sure it is safe for consumption, especially those on the west end of the community. A more reliable water supply system is also something that the village may need to consider in the future, especially if they experience any population growth.

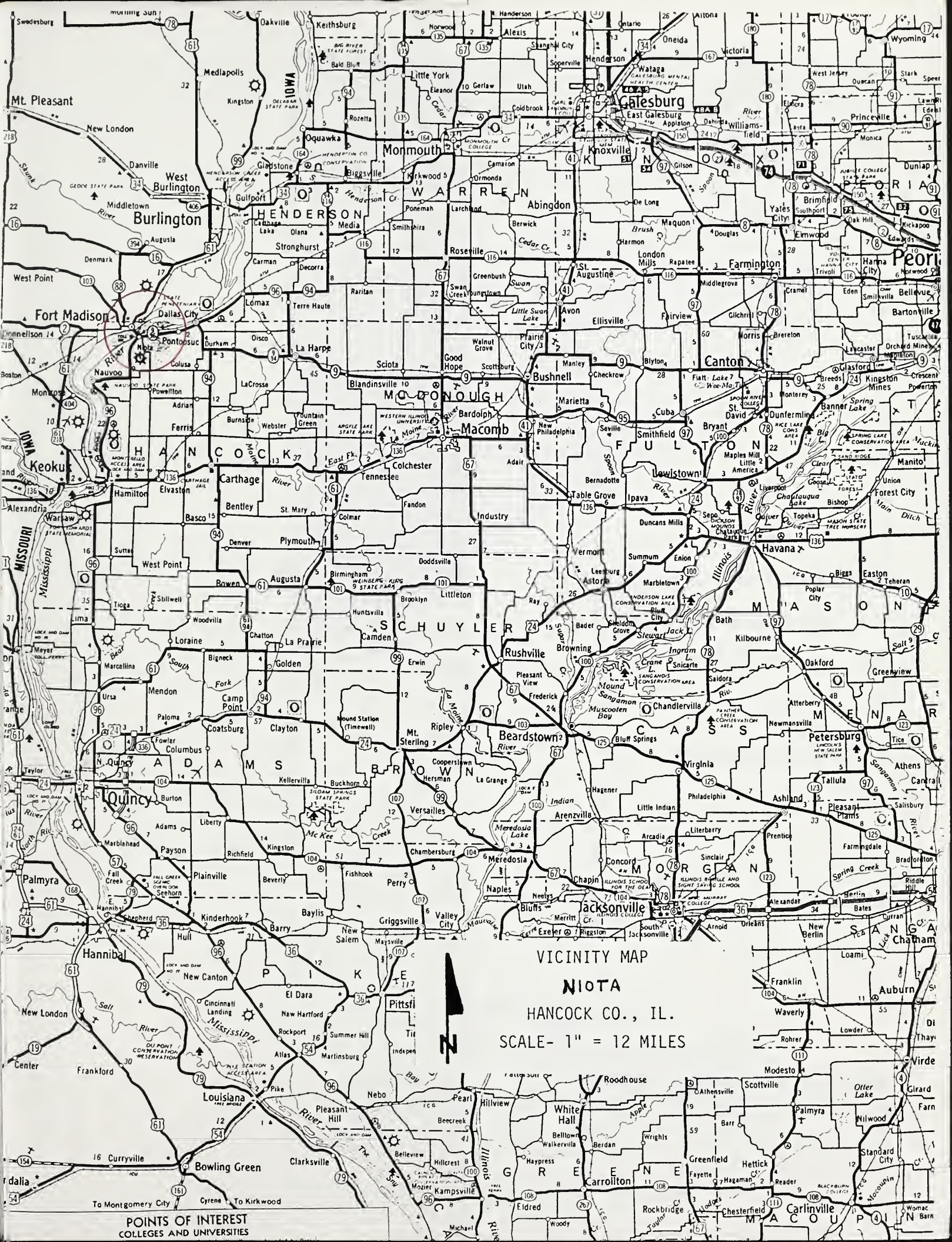
Better surface or subsurface drainage near the roads and streets in the village would allow them to drain faster. Several culverts need to be maintained as some have been "smashed down" or partially filled with dirt and debris. This would provide a firmer street, lessen the damage after wet periods, and thus be less costly to maintain.

The unnamed tributary to the south of the village should have the debris and brush removed from the channel. This will provide a better outlet for the rapid runoff from the steep hillside drainage above. The levee on the north side of this tributary will have to be maintained to protect the village from the rapid runoff periods.

A low priority should be assigned for a future detailed management study in Niota.

INVESTIGATIONS AND ANALYSIS

No additional calculations, discharges, or profiles were made as a part of this study. The inventory of flooding and water problems is based on a field review and interviews with local citizens. The Flood Insurance Rate Map, along with interviews with local citizens, was used to determine the 100-year floodplain. Aerial photographs were provided by DWR. Damages were based on property value estimates during the field review, and the application of damage factors. These factors came from previous detailed floodplain management studies.



VICINITY MAP

NIOTA

HANCOCK CO., IL.

SCALE- 1" = 12 MILES

POINTS OF INTEREST
COLLEGES AND UNIVERSITIES



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